CULTURE AND NATURE: THE EUROPEAN HERITAGE OF SHEEP FARMING AND PASTORAL LIFE

RESEARCH THEME 2: ARCHITECTURE

RESEARCH REPORT FOR GREECE

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PRISMA

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1. INTRODUCTION: HISTORY AND CURRENT STATE OF SHEEP FARMING IN GREECE

1.1 Historical background

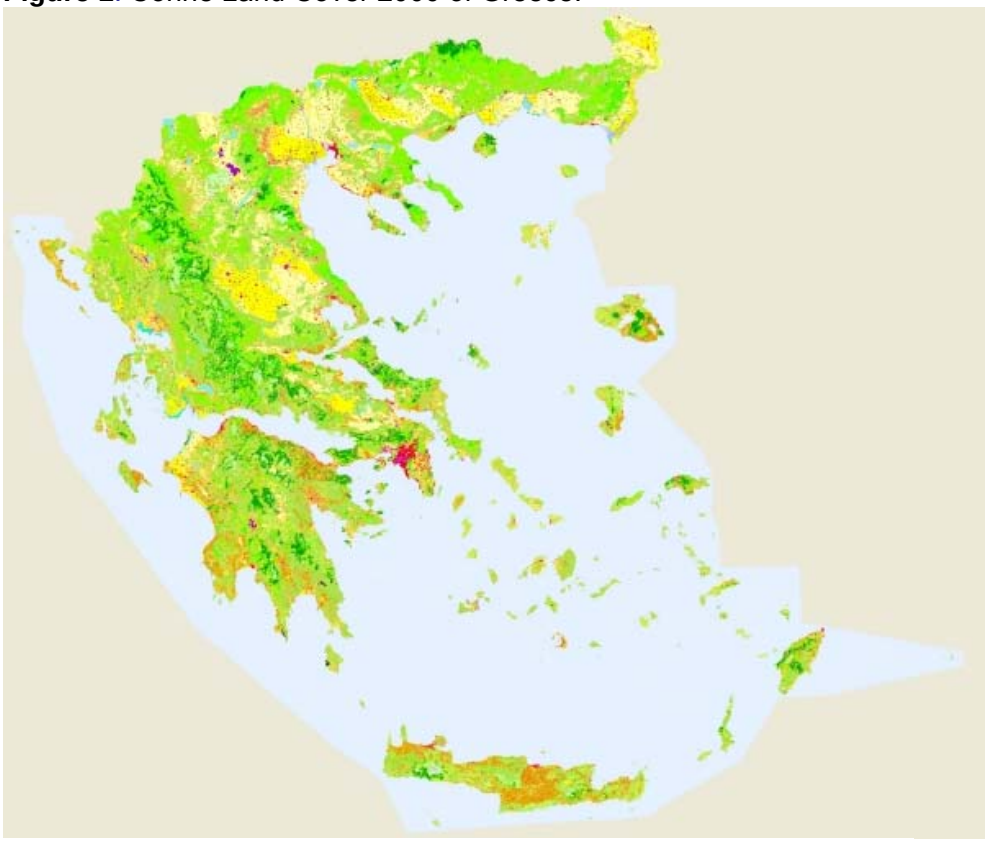
Sheep have been a resource which humans have been exploiting for millions of years (Rogdakis, 2001). The geographical, geomorphologic and climatic characteristics of Greece are particularly favourable to sheep farming. The mountainous terrain of the country, which proves difficult for other stock-raising, like bovine production, and the climatic conditions that allow for long periods of grazing have made sheep breeding a most important section of animal husbandry in Greece since ancient times, as it is generally the case in the wider Mediterranean geographical area (Kalaisakis, 1999). However, these areas, have recently suffered a strong decline in farming activity, mainly as a result of modern development forces, with the consequent abandonment of pastoral areas (Zervas, 1998; Rancourt et al., 2006). This situation led to changes in vegetation dynamics (mainly invasion of ligneous vegetation) and, therefore, in landscape structure and composition (Ispikoudis and Chouvardas, 2005).

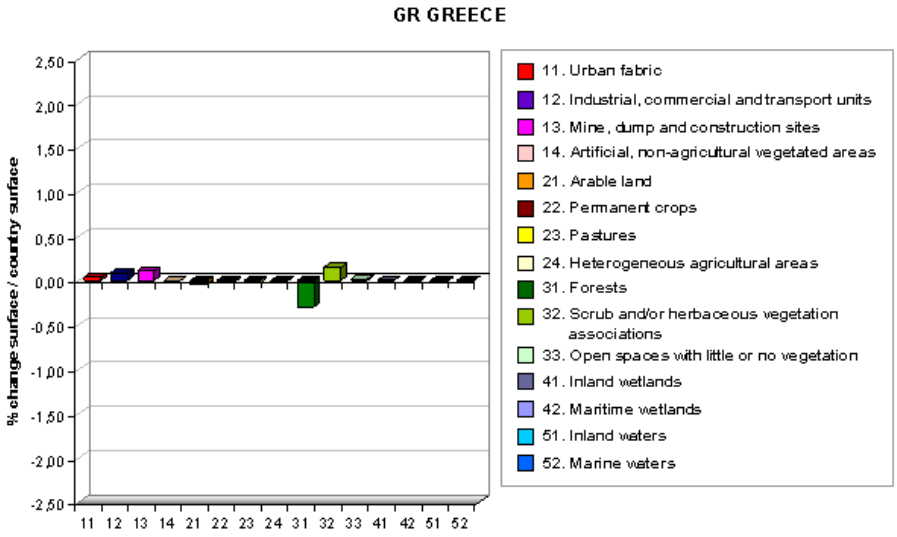
In ancient times, sheep and shepherds are inextricably tied to the mythology and the legends of the time; sometimes illustrating the history of the expeditions into far lands (the Argonaut Expedition), and other times tied to didactic stories (Aesop's tale of the little shepherd). Sheep breeding comprises an important part of the ancient Greek economy as testified by Homer and Hesiod. During the Byzantine years sheep farming became widespread in the whole expanse of the Byzantine Empire in contrast with the Central European regions which turned more to other livestock (Eustathiou, 1996). In the 18th and 19th century the tradition continues and the flocks move throughout the Ottoman Empire, something that becomes more difficult in the 20th century with the establishment of national borders.

During the 1920s the country undergoes geopolitical changes and along with that sheep farming is transformed as well. An important influx of population due to the annexation of western Thrace and immigrants from Asia Minor, many of whom were farmers and livestock farmers, leads to a decrease in land available for grazing, as it was then given to crops, and there is a changeover from expansive to intensive farming. The once flourishing nomadic sheep farming, by the Saracatsan in Thrace, the nomads of Thessalia and others, falls into decline (Hatziminaoglou, 1999). At the same time different indigenous breeds of sheep are threatened with adulteration due to cross breeding, or even with extinction. During the 1940-50s large number of sheep farmers move from the mountainous areas to the lowlands and until the 1960s sheep cross breeding becomes extensive. After the 1960s there is an effort to improve the breeds more systematically and to restructure sheep farming. However, contrary to other

countries' practices that aim to improve animal stock by selectively improving pure breeds, in Greece a policy of extensive crossbreeding is applied, leading to the demise and extinction of some rare indigenous breeds (Rogdakis, 2001, Hatziminaoglou, 1999).

Figure 1. Corine Land Cover 2000 of Greece.





1.2 Sheep farming in Greece today

Today sheep and goat-raising is one of the most active economic sectors in Greece, contributing around 18% to agricultural income and representing more than half of the country's animal production. Being the fifth country in the EU in sheep and goat production, about 45% of the total number of goats in Europe is raised in Greece. The number of animals in 2005 was estimated around 14m sheep and goats according to the Ministry for Rural Development and Food and the Hellenic Statistical Service, raised mostly in small family units and following extensive grazing methods for a majority of 85% of them.

Figure 2. Distribution of sheep population in the E.U. in 2007. *Source Eurostat*

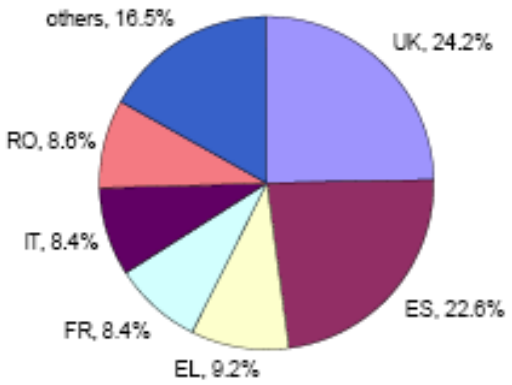


Figure 3. Distribution of goat population in the E.U. in 2007. *Source Eurostat*

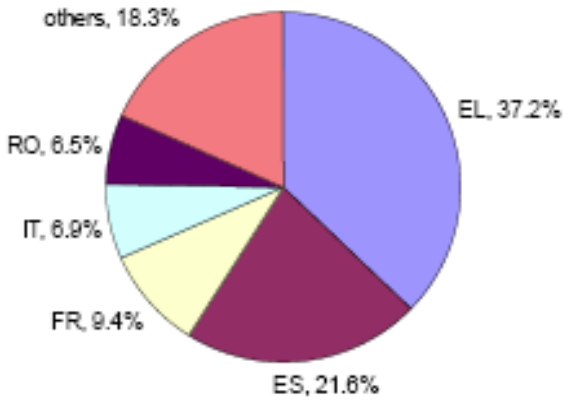


Table 1. Distribution of sheep and goat population in Greece (1911-2007).
Source: National Statistical Service of Greece (NSSG)

YEAR	NUMBER OF SHEEP	NUMBER OF GOATS	TOTAL NUMBER
1911	3.565.442	2.618.043	6.183.485
1929	5.805.646	4.179.214	9.984.860
1950	5.911.947	3.161.034	9.072.981
1961	8.191.836	4.331.627	12.523.463
1971	7.482.660	4.243.780	11.726.440
1983	6.681.980	3.632.300	10.314.280
1991	8.692.286	5.336.443	14.028.729
1999	8.752.668	5.327.201	14.079.869
2002	9.058.117	5.669.198	14.727.315
2007	10.079.903	4.987.092	15.066.995

Table 2. Livestock products: 2002-2006

Livestock products: 2002-2006

In tons

Products	2002	2003	2004	2005	2006
Meat	472.117	474.678	491.774	498.584	458.864
Beef,veal	*73.176*	*74.428*	*77.128*	*72.576*	*72.988*
Pork	*109.605*	*11.087*	*107.521*	*109.414*	*108.470*
Mutton, lamb	*96.183*	*96.985*	*93.538*	*92.557*	*94.340*
Goat	*59.199*	*59.881*	*57.759*	*57.404*	*57.762*
Other	*133.953*	*132.297*	*155.828*	*166.633*	*125.303*
Butter	4.140	4.184	3.793	3.077	3.101
Milk	2.069.097	2.066.834	2.038.308	2.054.309	2.064.694
Cheese hard	38.083	38.552	47.136	45.222	37.800
Cheese soft	132.335	126.426	122.449	125.947	120.036
Myzithra	12.864	12.593	13.071	12.591	15.887
Milk cream	6.323	5.656	5.526	5.245	5.062
Eggs	105.321	87.145	100.504	100.086	99.480
Honey	15.674	15.734	15.911	16.267	16.218

Source: National Statistical Service of Greece (NSSG)

However, in the later years there is a tendency for organized sheep and goat farming units, with a decrease in the number of productive animals that are raised by nomadic methods. About 85% of the grazing land is in mountainous areas and more than half are

communal land. As a result, a large part of the communal grazing land is degraded. Spatially the production of sheep and goats does not present any differentiation throughout the country. Due to the geomorphology and climate of Greece, most of the sheep and goat farming units are to be found in mountainous and disadvantageous areas. For the year 2005, it was estimated that 110.000 farming units with more that 10 animals each were operating, while the average size of a unit was 84 sheep and 99 goats (MRDF, 2007).

The traditional extensive grazing methods used in Greece are very close to the organic husbandry methods, making organic animal farming easier for farmers and shepherds, a fact which is confirmed by the large number of certified animals. Out of the 380.000 certified goats in Europe, 49% are to be found in Greece (MRDF, 2007). The number of organic animal farms is constantly rising. Of all the organic animal production in the country in 2004, 49% were goats and 30% sheep with increasing trends (MRDF, 2004)

One differentiating element from the rest of the European countries is the fact that in Greece sheep and goats are raised for milk production rather than meat, leather or wool (MRDF, 2007, Christodoulou, 1999). From this, 90% of sheep and 80% of goat's milk is used in cheese-making, especially for the production of Feta and other traditional Greek cheeses, but also for the production of yogurt. The produced sheep and goat milk is sufficient to cover the national market, with a minimum of imports not affecting the market.

In Greece the average consumption of sheep and goat meat is four times that of the European one and according to 2004 data, 86% of the market is covered by local production. The remaining is covered with imports from neighbouring Romania and Bulgaria of meat and livestock, or frozen meat from New Zealand and other countries. The preferred average weight of the animals in the Greek market is of the lowest in the EU and the world, where it is common to consume animals of older age (mutton) (MRDF, 2007).

1.3 Indigenous sheep breeds in Greece

The presence of sheep in the geographical area of Greece is lost in the mists of time. The indigenous breeds are the result of genetic material of many types and origins (Hatziminaoglou, 1999). In the mainland and the islands breeds descendant from the Zackel[1] category are mostly present, while all the highland and some of the lowland

[1] *Zackel sheep*: a group of horned breeds of sheep widely dispersed through Europe and Asia. Used for carpetwool, meat and milk. Mostly white, some are brown, black or pied. Males have long spiral horns, females may be polled. Most breeds have long, thin tails. Greek milk, carpetwool or meat sheep, polled or horned, usually white with black or red spots on face and legs. (Saunders Comprehensive Veterinary Dictionary, 3 ed. © 2007 Elsevier, Inc.)

breeds belong to this category. To a lesser extend, breeds from the north-east of the country and in some of the Aegean islands belong to the Ruda[2] category, which have a finer fleece. Furthermore, in the islands of the eastern Aegean there are semi-fat-tailed breeds of sheep, which are influenced by the breeds from Asia. Today, many of the breeds have been mixed due to random cross-breeding, while quite a few indigenous breeds are becoming rare or extinct. It is believed that the pure-breed sheep correspond to only a 10% of the current livestock population (Hatziminaoglou, 1999). According to the research by the Agricultural University of Athens, a number of indigenous Greek breeds like the Drama Native breed, the Katafigion breed, the Roumloukion breed, the Levkimmi breed and the finer-fleeced Chalkidiki breed can be considered extinct (Rogdakis, 2001).

The highland Greek breeds refer basically to the same type of sheep (mountain Zackel) but get their different names due to geographical and historic reasons and they include the Vlach breed, the Sarakatsan (also Karakachan, Karatsaniko)- the breed of the nomadic Sarakatsan shepherds, the Boutsiko breed, the Sitia the Psiloris and Sfakia breeds from Crete, the Arvanitovlachiko breed. Their raising is following a semi-extensive system, with the flocks moving to the highlands during the summer (Hatziminaoglou, 1999). The raising method, if done properly, can offer environmental benefits in the fragile Mediterranean environment and offer opportunities for organic sheep farming. From the highland breeds the Boutsiko breed is of special interest, and it is bred mainly in the northwest and western Greece. The Sfakia breed is also of interest. It amounts to about 60.000 animals, bred in the western part of Crete and is a hardy breed. It is mainly used for milk production and cheese making.

The lowland Zeckel sheep breeds include the Karagouniko (a common breed, the second most numerous in Greece) which is found is the Palamas-Trikkala area of Thessaly, and, also, in the Macedonian plains and in Boeotia and it is raised by semi to full intensive methods. Another lowland breed, of the Ruda type this time, is that of Serrai, a stationary breed kept on the plain of the same name in northern Macedonia and raised mainly for milk production (FAO, 1978). Thraki is the Greek name for the Kivircik breed, the finest-wooled sheep of Turkey. It is also a lowland breed of the Ruda type of sheep, and is now endangered due to low prices in wool.

The Arta breed (Frisarta) found in the lowlands of Arta and Preveza in the western part of Greece, is the result of crossbreeding in the last forty years between Friesian breed

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[2] Each Balkan country has a finer-fleeced type, in addition to the predominant coarse-wooled Zackel. A common name for these is Ruda (uniform-wooled) sheep, and MASON (1967) states that they perhaps are derived from the Romanian Tsigai. However, the primary breed may be the Kivircik of Turkey. (FAO, 1978)

and Greek breeds of Arta. This breed has the best milk production rate than the other Greek breeds and a good meet production, however, it needs more care and is a lot more sensitive to pulmonary diseases (Hatziminaoglou, 1999).

Furthermore, there are also the island indigenous breeds, from which four out of five are rare or endangered (Rogdakis, 2001). The Chios breed (in Chios island) has a very good milk production and is well adapted in most climates, however, it's population is declining. In the island of Chios it is mostly raised for private household consumption, whereas in the mainland of Greece and in Cyprus it is raised with intensive methods. Another endangered island sheep breed raised mainly for household consumption, despite its good milk production performance, is that of Skopelos found in Skopelos and the North Sporades islands of the Aegean. The Kumi breed is a similar and related breed, which is also rare, although it is bred for study purposes and therefore it is not endangered (Hatziminaoglou, 1999). The breed of Zante, in the island of Zante in the Ionian sea, is one of the largest in size, with a rather good milk production performance, which is bred only for private household production. It is believed to be a crossbreed, similar to the Italian breed of Bergamasca, imported by the Venetians (Hatziminaoglou, 1999, Rogdakis, 2001).

Quite different from these island breeds is the Lesvos breed, which is a more common breed, of medium production, which has been crossbred in several parts of Greece. The interest in this breed focuses on its ability to produce even under unfavourable conditions.

Generally speaking, in Greece the number of pure breed animals is quite low due to extensive and unorganised crossbreeding with imported breeds. Therefore the protection of the remaining rare breeds is imperative in order to preserve, not only the genetic material, but also the cultural and ethnological heritage of sheep farming.

Locations (many generalized) of the Zante, Imroz, Vlach, Sarakatsan, Drama Native, Florina, Karagouniko, Sfakia, Psiloris, Sitia Serrai, Roumloukion, Thraki (Kivircik), Argos, Chios (Sakiz), Odemis, and Dağlic breeds, FAO 1978.

2 HISTORY OF PASTORAL STRUCTURES

2.1 Sheep farming in permanent settlements

Greece has been traditionally an agricultural society. Agriculture still contributes largely to the GDP of the country. Traditionally and even now, farming has been organised in small family farms, keeping a small number of animals principally for satisfying the household's needs in milk products, wool and meat. This combined with the small sizes of land plots have influenced the traditional architecture in the rural areas. The older types of buildings would have to cater for the needs of the family and their livestock as well. The simplest type of building consisted of one rectangular building separated in two parts, one containing the family, resting area, cooking facilities etc, and one part for the

keeping of the animals, possibly foodstuff and their produce. As income and household size increased, dwelling types changed as well, with the addition of another floor which then became the family residence while the lower floor was reserved to the animals and the produce. With time this dual function of the dwelling, which provided shelter for both the family and the animals was abandoned in the second half of the 20th century and flocks were kept near villages, in sheep pens sometimes adjacent to residences and more often away from the village. Often, the structures located outside the villages are stone-built, incorporating a large range of functions, from cheese-making to milking the ewes to storing the feed. The evolution of these sheep pens are the modern sheep farming units which are designed according to statutory standards of hygiene and animal welfare, being more or less modest structures.

Village house with animal shelter at ground floor

2.2 Nomadic sheep-farming

Larger-scale sheep farming was also practiced in Greece by shepherds' communities who mostly led a nomadic life. In the Mediterranean area, since antiquity, large flocks of sheep and goats could not stay in the same territory during both winter and summer. During the winter, the flocks needed to be taken to lowlands, where a mild climate predominated, while during the summer the high temperatures made their transfer to upland pastures necessary. Testimonials from the 11th century reveal that all nomadic shepherds were already know in Greece and referred to as Vlachs (named after the ethnic community of Armano-Vlachs) or later, in texts of the 18th century, they are referred to as Vlacho-shepherds. Extensive sheep farming (i.e. occupying large areas and being the opposite of intensive) was termed "vlachiko" and was considered to be much more than an occupation; rather, it denoted a lifestyle, a worldview and a code of common values that regulated social and economic life with equal terms for all.

We can distinguish between two types of nomad shepherds:

- the semi-nomads, who returned during the winter always to the same place, their native villages, where they had property and other community rights, these shepherds had to negotiate the use of upland pastures in the summer, away from their home village, and
- the nomads, who did not possess property or community rights in any village and had to negotiate and rent pastures during both winter and summer.

The best known shepherds' community of the second type is Sarakatsans. Although initially concentrated in north-western Greece and the mountains of Pindos, during the 18th and 19th centuries they dispersed widely to many other areas, such as northern Greece (Thrace and central-eastern Macedonia), in Thessaly, Sterea Ellada, and in the islands of Evia and Crete, as well as in Bulgaria . Despite their dispersion, Sarakatsans maintained their cultural cohesion and cultural identity till the present days, when most of them have abandoned shepherding and have been integrated in rural and urban settlements.

The structures used by nomad shepherds to protect their flocks and themselves were simple, easy to set up and wisely insulated against extreme heat or cold, using spontaneously the basic principles of bio-climatic construction. Semi-nomadic shepherds who returned to the same upland places year after year, used to construct more permanent buildings of stone. Round structures, covered by a dome or a flat roof are typical examples of such buildings, used for cheesing making and as a shepherds' refuge. "Tholi" in Magnesia (central Greece) and "mitata" in Crete are representative examples of such round structures.

Non-permanent structures are typical of the purely nomad shepherds, such as Sarakatsans. The huts that are the symbol of Sarakatsan life, is reminiscent of primitive huts in many other parts of the planet. Made of tree branches, twigs, straw and clay, they are bio-climatic, sturdy and easily constructed. Sarakatsans moved as communities, termed "tselingato" which consisted of one or more extended families (even as many as 15) forming a viable economic unit. These families constructed several huts to house their members and carry out complementary economic activities, such as cheese-making or weaving, so that a constellation of closely located huts was created, neighbouring the sheepfold.

Sheepfolds consisting of temporary thatched structures were common not only to Sarakatsans abut also to semi-nomadic shepherds and also to shepherds of the smaller-size flocks that stayed near the village throughout the year. These structures can be elementary, consisting only of sheds and a fence; or more sophisticated, using construction principles similar to those of the Sarakatsan hut.

Saracatchan huts

2.3 Current situation

The mechanisation of agriculture and the availability of dried animal feed changed the pattern of sheep farming after the 2nd world war. However, in many areas of Greece the traditional semi-nomadic pattern is still widely in use, for two reasons: firstly, because immigrant workers have been appointed to look after the sheep when they are in upland pastures, away from the permanent residence of the shepherd; and secondly because the quality of milk improves drastically by grazing natural grass, thus assuring a good price for the shepherd.

Thus, in contemporary Greece, shepherds' huts and sheepfolds are still evident in upland areas outside the villages, adopting more or less the same principles of the older temporary huts, but using different materials; while the main installations of the sheep farm are usually modern buildings with mechanised milking facilities and refrigerators for keeping the milk, as well as large lattice-floored rooms for the flock, built and kept according to hygienic standards set by the Ministry of Agriculture and the big dairies.

Temporary structures are now made with materials that are cheap, easily provided and preferably re-used. Timber, corrugated iron or zink, chipboard panels as well as branches, twigs, straw and other materials are put together in unpredicted combinations. Such structures have been denounced by many as "polluting" aesthetically the countryside; while for others, they are characterised by archetypal values, reflecting primitive, unpretentious aesthetics and being accepted as "specimen of decline and deprivation" for their face value. These structures have been studied by several contemporary Greek architects (Aris Konstandinidis, 1994, Giorgos Traintafyllou, 2010), as will be further referred to below.

Contemporary sheep farming structures

3. TYPES OF PASTORAL STRUCTURES

3.1 Definition of types

As discussed above, two predominant types of pastoral structures are evident in Greece: permanent structures and temporary ones. The main difference between the two types lies in the building materials used. The functions of the pastoral buildings are also an important factor in determining their types. We have already referred to combinations of sheepfold and residence of shepherd; enclosed structures with roof for the animals to be protected against the weather; sheds; fenced enclosures; small structures for cheese-making, etc.

If we combine type of materials with the function and length of the building's use, we can derive a typology which distinguishes between continuous use of buildings and temporary use of them during summer and defines different types according to hard and light materials, different functions, forms and shapes. The following types emerge from the review:

Combined family residence and animal shelter; made by hard materials (usually stone) – used throughout the year; mostly rectangular structures.

A typical example of this type of building is "makrinari, common in many mountainous villages of the Peloponnese, dating from the 1800s when skilled builders form the village of Laggadia were employed for the construction of houses, churches and bridges. Sheep-farming in these areas was traditionally characterised by small flocks for household use and for this reason the buildings combined the two main functions, i.e. human residence and animal shelter. Makrinari is a narrow rectangular building of a compact and austere shape lying at right angle to the planar curves, with an entrance always at the longer side; it can be either a single-storey building (monospito) or a two-

storey one, separating the two main functions in different floors. A later version of makrinari includes a basement, “katoi”, with an independent entrance where the livestock lives, foodstuffs are stored and milk is temporarily kept until is it sold or consumed. The two upper floors “anoi” are the living quarters of the family, providing more comfort than in previous versions of makrinari.

Various views of Makrinari



Self-contained sheepfold, close to residence or standing alone outside the village; made by hard materials (usually stone or combination of hard and soft materials) – used throughout the year; combination of rectangular and irregular or round structures.

An example of this type is the “mandra”, typical of the island of Lemnos and common in many other areas of Greece, both mainland and islands. Mandra consists of a large fenced area and a number of buildings of varied sizes and functions. They are usually built by drystone masonry and their layout is irregular, placed at various angles within the compound, indicating that they are not built all at the same time. Indeed, mandras evolve over time, according to the needs of the flock and the shepherd, housing not only the sheep under demanding weather conditions (cold or hot) but also providing a cool house for the milk, space for cheese-making facilities, foodstuffs storage etc. The fence is built by the drystone technique and often it is partly demolished and rebuilt to expand the area of the pen, when the size of the flock increases. The changes and additions over time in the shape of the fence and the size and combination of buildings give a particular charm to the architectural outcome.

Mandra in Lemnos

Contemporary farm in Kynouria, Peloponnese

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Wooden structures made of oak planks and covered by a slated roof are found in northern Greece and are used by both the permanently settled shepherds and the semi-nomads (Karamanes 2011). Typical of these structures is the hut, called “prováta”, a relatively small building used as a shelter for the flock during the winter. Today the term prováta is used for larger structures as well, which include a storeroom for hay beside the space for keeping the sheep.

Rounds structures with dome, stone built, used during the summer mostly by shepherds for storage and shelter, as well as for other productive activities.

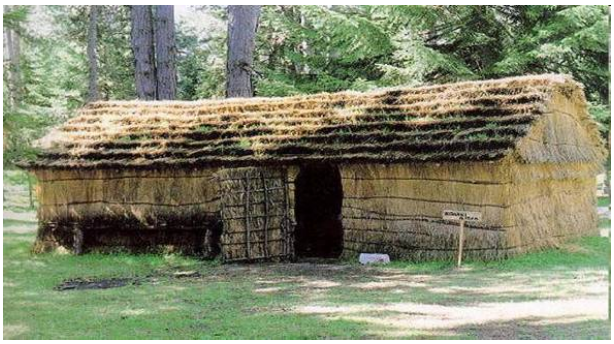
These structures are found in many regions of Greece, bearing different names. In Magnesia, mainland Greece they are called “tholoi” (meaning domes), in northern Greece they are called “coliba” or “petrokalyves” (stonehuts) and in Crete they are known as “mitata”. There are several types of dome construction: spherical-wedged, parabolic, cone-shaped. A large number of these constructions have an age of two hundred years or more and many are still standing in good condition. They are built by the drystone technique and merge into the surrounding landscape both in terms of colour and texture. In Crete, the structure is partly sunken into the ground and the dome is often covered by earth, thus assuring coolness in the summer. The functions of these domed structures vary from place to place, although cheese-making and cheese storage are central uses, as well as providing temporary residence for the shepherd or simply shelter from the heat, the cold and the rain.

Tholoi in Magnesia, Central Greece

Mitato in Crete

Straw huts - round structures built with soft materials (tree branches, twigs, straw, clay and other natural materials) to house the shepherd and his family.

Such huts are the typical structure that provides residence for humans, shelter for animals and storage for the Sarakatsan shepherds, but variations of it are also built and used by other mountainous communities, such as the Pomaks. The structural and morphological sameness of these huts with pre-historic residences is a common finding of researchers. There are two types of Sarakatsan hut: a) the round hut with cone-shaped dome, which was used for residence ("ortho or tourloto konaki"), as an auxiliary space ("halatzouka") or for sheltering animals ("mandri" or "tsirkos"; and b) the rectangular hut, with pitched roof, used for storage, to keep the animals, for cheese-making or as a school for the children "diplo kalyvi".



Sarakatsan huts are a rare example of spontaneous architecture demonstrating a successful relationship between construction method, morphology and economy of design. To build the hut, the outline (round or oblong) was traced on the ground, the central wooden poles were then fixed and the horizontal links positioned, and then the frame was covered with rushes, straw, rye, twigs and other natural materials, creating a thick thatch. Although the building method was very simple and plain, the result was sturdy and watertight, providing good insulation from the heat of the summer. However, the huts had to be rebuilt every three to four years, as the natural materials were worn it.

The main residential hut, "konaki", had a hearth placed in its middle ("parastria or vatra"), various selves called "krevataries" built around the perimeter to accommodate the clothes, the blankets, the food of the family and the kitchen utensils, all in separate compartments. The kervataries were constructed by weaving twigs and reeds, resting on top of mud-built mantels (Karali, 2008). An outdoor hearth was often built next to the hut, called "gounia". The huts were traditionally constructed by the women of the Sarakatsan community. The fences of the compound were also constructed by "woven" branches, poles and straw, creating with the various round and rectangular huts a harmonious

complex which sustains a dialectical relationship with the surrounding vegetation and mountain forms.

Sarakatsan compound

Temporary sheds of all types, built with natural materials, to provide shelter from the sun for animals and/or people.

These are structures made usually from timber poles and a roof made of tree branches, hay or any other dry vegetation at hand. They are either flat or pitched and were re-constructed every year in the summer, on arrival of the shepherds and flocks. These are very light and elegant structures, often considered as an identity symbol of the summer refuge of flocks. Important contemporary architects and sculptors, such as Demetris Pikionis and Kostas Tsoklis have been inspired by the form, materials and intuitiveness of these structures.

Such sheds are known as “tsiardaki” in many parts of Greece and have been typical of the semi-nomadic shepherds, used mostly for milking the sheep.

Traditional and contemporary sheds

Contemporary huts for permanent or temporary use, made of timber, corrugated iron or zink, straw, wood panels, planks, wire and other soft reused materials.

These are controversial structures which are built with anything that comes the shepherd's way, usually materials from a demolition nearby, or used sheets of zink from a farm or industrial unit, combined with corrugated iron or asbestos and natural materials such as branches, straw, planks or even old rugs and wire mesh. For most, these are unsightly structures, offending the harmony of the natural landscape and projecting to visitors the misery and lack of aesthetic quality of contemporary spontaneous architecture. For others (among them the architect G. Triantafyllou and the sculptor K. Tsoklis, 2010) these are specimens of the intuitiveness of contemporary farmers and shepherds, bearing similarities, although unwittingly, with the aesthetic explorations of modern architecture and sculpture (see also above ch.2). These structures can be seen everywhere, either in the outskirts of villages or scattered in the open countryside, denoting usually that a sheepfold is nearby or around them.

Enclosures are also important features of pastoral architecture.

We can distinguish three general types of enclosures: those made of stone, using the drystone masonry technique called "xerolithies", which are ubiquitous in Greece, and characterise both mainland and islandic landscapes; those made of wooden poles linked together with tree or bush branches; and the contemporary ones, made of wooden or metal poles linked together with metal wire or mesh. Such enclosures take various names: they are called "greki" in northern Greece, meaning in particular the open space where the animals sleep during the summer; or "korda", the open space where the animals are kept while waiting to be milked (Karamanes, 2011).

Examples of craft units, manufacturing sheep and goat products: tanneries, wool cleaning in mills

In traditional sheep farming the wool and skin of sheep and goats have been important products which were either processed by the shepherd's family or sold to skilled craftsmen. Wool was usually processed by the women, turned into fibres with a spindle and then woven in looms. Woven rugs and blankets were then taken to **water mills** to be swirled in the water wells of the mill, the "nerotrivi", and thus become soft and fluffy. Flour mills are even today offering their wells for cleaning and restoring woven rugs and similar items, been considered as one of the most effective and environment-friendly way for laundering woollen items, given that no soap or detergent is used, but cleaning is achieved by the power of the swirling water. Traditional water mills were stone built rectangular structures, including an external or internal well which recycled the water that powered the turning of millstones. The wells themselves were also stone built, and were

multiplied in big mills to satisfy the demand of the surrounding villages for washing their woollens.

Skin, especially goat skin, was traditionally a precious product which was turned to fine leather in tanneries. **Tanneries** tended to gather together, because of the strong smell that leaked out of them, which was quite disturbing for surrounding residences. In the town of Amfissa, in central Greece, tanneries formed a distinct neighbourhood in the upper part of the town, located at a distance from the core of the settlement. Skin tanning was practiced in Amfissa before 1600, as reported by the English explorer Dodwell who visited Greece at that time. Tanneries used the rich water source in the area of Harmaina, which had the unique property of turning the colour of the skin to an indelible soft silky yellow, suitable for making parchment, house shoes, bags, wallets and other fine goods. The tanneries neighbourhood of Harmaina was abandoned in the middle of the 20th century, when new regulations did not allow tanneries to operate in proximity to residential areas and following also a sharp decline of the skin market. The neighbourhood of Harmaina is today a protected area of architectural value, with its two-storey crafts buildings and narrow streets.

Swirling water well for woollens “Nerotrivi”

Harmaina, the neighbourhood of tanneries

3.2 Internal organisation of sheepfolds

The traditional sheepfold included a number of constituent functions, as follows:

- a place for milking, often called “strouga’,
- the pen or corral, called “mandri”
- an area where the animals can stay during the hot hours of the day, often called ‘stalos’
- makeshift shelters for sheep and shepherds called ‘konaki’

- the hut or ‘kalyva’ where the shepherds stay
- the ‘yiataki’, an open air shadowed place where one can sleep
- the fire hearth called ‘fotanama’ or ‘pyrovoli’
- the cheese-making facility and storage called ‘tyrias’ in the mainland oor ‘tyrokeli’ in Crete (Eustathiou, 1996, Deligiannakis, 2003)

3.3 Styles and aesthetics

Traditional permanent structures, such those met in Peloponnesus (makrinari), in Lemnos (mandra), in Crete (mitata), in Magnesia (tholi), among other examples, have a high value based on simplicity, functionality and elegance. Built by normal masonry or drystone masonry these simple buildings are integrated in their landscapes, forming part of them. Especially the buildings that stand alone in the countryside, like tholoi, mitata or mandras, are immersed in their environment which often includes drystone walls and terraces.

Temporary structures and those constructed with soft materials, such as timber and straw. The most characteristic of these structures is the Saracathan hut with its round shape with domed thatched roof. This type of hut has been highly celebrated by modern architects as a source of inspirations, combining a primeval form with intelligent and imaginative building techniques that create a shelter from the most modest natural materials.

Also, sheds made of timber, twigs and straw have been reassessed by the prominent Greek architect Aris Konstandinidis (1994) and included among the natural and manmade structures he terms “theoktista” – structures of god.

Contemporary huts and sheepfolds, according to Triantafyllou (2010), are characterized by archetypal values; he then goes on to identify direct and indirect relationships with contemporary art and architecture. Works by prominent artists, as well as works of contemporary architecture, are juxtaposed alongside these anonymous shelters, highlighting them as archetypes reflecting the “poetry of the plain and uncomplicated”.

Pictures: G. Triantafyllou

Contemporary shepherd’s hut, C.Macedonia The new Acropolis Museum by B. Tsoumi

Contemporary shepherd's hut , Evia

Guggenhein Museum, Bilbao, by *F. O. Gehry*

4. CONCLUSIONS

Traditional pastoral architecture in Greece has been varied and versatile, including both permanent and non-permanent structures. The permanent structures consist of buildings that follow the style, construction methods and materials of the vernacular architecture that is prevalent in each region. They form often parts of a settlement (a village or a constellation of farms or crafts workshops) and they are integrated in the layout and morphology of the wider compound where they belong. Isolated buildings that form part of a sheepfold built away from the shepherd's home or village are modest, austere buildings of rectangular shape with pitched roofs, presenting the qualities of spontaneous vernacular architecture, e.g. simplicity and elegance of single buildings based on their strict functionality and economy of design and materials; interesting combinations of shapes and location of buildings within the compound of the sheepfold, due to gradual development of functions and spaces to serve evolving and new needs. Clever solutions to insulation from heat, cold and water are also demonstrated, using the local wisdom that finds solutions to dealing with the climatic conditions of the particular region (islandic, mountainous etc).

Permanent round structures made of stone carry a special importance, carrying forward a tradition that dates from antiquity and resembles similar traditions in Italy and France. Round shapes are equally typical of non-permanent structures, dating from pre-historic

times and providing models of survival, wise use of natural materials (mostly branches of trees and bushes, straw and clay), hard-wearing shelters, ingenious water and heat insulation methods and unique aesthetic outcomes. These huts are typical examples of the development of primitive construction methods and forms, variations of which can be also found in Africa.

The open, light non-permanent constructions that are used as sheds for the flocks are the simplest possible structure that one can find, demonstrating also the wisdom of using modest and easily found natural materials to create well-balanced constructions that can last for a season and be easily re-constructed the next year. All these temporary structures, huts and sheds, have been associated with the nomadic or semi-nomadic lifestyle of shepherds after the 11th and up to the first half of the 20th century and reflect intelligent solutions to quickly constructed shelters for humans and animals, using natural materials that are available in upland pastures, where forests are usually in close proximity. They also reflect highly developed skills, often possessed exclusively by women, that were passed on from generation to generation within the shepherds'' communities, assuring the survival and welfare of the nomadic community.

Finally, contemporary shepherd's huts and sheds in Greece offer a highly controversial aesthetic result, although it should be recognised that the combination of materials used in them is unique and carries certain advantages. The practice of recycling and re-using scrap and trash materials teamed with the traditional timber, tree branches and straw, the juxtaposition of zink, planks, wire, cloth, straw and other natural and non-natural materials, lead to an aesthetic result that is not always friendly to the eye, being unusual and provocative. However, there is a trend among modern architects in Greece to celebrate these examples of contemporary spontaneous architecture as authentic, inventive and respectful of their environment, meriting a much more serious consideration and offering inspiration because of their originality and friendliness to rural landscapes.

5. LITERATURE

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